CLTS

Chris Little Training Services Ltd.

Courses For Site Engineers:

CLTS/SE1 Levelling & Setting Out of Heights
[2 Day Course]

The course is designed for site managers, foremen, supervisors and trainees who are required to level points and set out defined heights for construction and civil engineering work.
Little or no previous experience is required, but some basic understanding of the need to use levels and transfer height information is desirable.

On completion of the course delegates should be able to:-
- **Set up and use automatic levels and laser levels.**
- **Read the level staff, book and reduce levels.**
- **Understand sources of error in leveling.**
- **Check the level for collimation error.**
- **Establish a working temporary benchmark on site.**
- **Observe, record and calculate the level of existing features.**
- **Set out given level values, including soffits.**
- **Calculation of drainage run.**
- **Set out profiles and calculate traveller lengths.**

CLTS/SE2 Theodolite Setting Out and Alignment
[1 Day Course]

The course is designed for site managers, foremen, supervisors and trainees who are required to set out for construction and civil engineering work. It is aimed at staff with little or no theodolite experience, or as a refresher for those who have not used the equipment for sometime.

On completion of the course delegates should be able to:-
- **Set up and use modern electronic theodolites.**
- **Complete collimation checks on the instrument in the field.**
- **Extract setting out data from drawings.**
- **Calculate bearings and distances from coordinates for setting out.**
- **Set out points for building work using a theodolite and tape.**
- **Correct tape distances for slope, temperature and tension.**
- **Read and record angles and distances for checking position.**
- **Use theodolite for horizontal and vertical alignment.**

CLTS/SE3 Introduction to use of Total Stations (EDM)
[1 Day Course]

The course is designed for site managers, site engineers and those who are involved in setting out and establishing survey control for construction and building work. The course is suitable for staff with some theodolite knowledge, but little or no total station/EDM experience.

On completion of the course delegates should be able to:-

- **Set up and use Total Station/EDM.**
- **Understand how EDM work.**
- **Understand use of different coordinate reference systems.**
- **Extract setting out data from drawings.**
- **Calculate polar coordinates for setting out.**
- **Set out points using a Total Station/EDM.**
- **Understand need to Quality Control, and checking of the set out points.**
- **Understand the sources of errors in EDM equipment and setting out.**

CLTS/SE4 Site Surveying and Setting Out for Engineers Phase 1
[2 Day Course]

The course is designed for site engineers and those who are involved in setting out and establishing survey control for construction and building work. It is suitable for staff with some theodolite knowledge, but little or no total station/EDM experience.

On completion of the course delegates should be able to:-

- **Understand basic concepts of survey; the nature of errors, and their effects on survey measurements, and the need for Quality Control.**
- **Set up and use Total Station/EDM.**
- **Understand how EDM work.**
- **Understand use of different coordinate reference systems, including Ordnance Survey grid.**
- **Extract setting out data from drawings.**
- **Calculate polar coordinates for setting out.**
- **Set out points using a Total Station/EDM.**
- **Understand need to Quality Control, and checking of setting out.**
- **Understand the sources of errors in EDM equipment and the process of setting out.**
- **Use Total Station/EDM functions such as Resection, Remote Elevation Measurement, Reference Line etc.**

CLTS/SE5 Digital Data Transfer: Total Stations / PCs
[1 Day Course]

The course is designed to follow on from Introduction to Total Stations course, but it can also be taken as a standalone course. It is intended for engineers and those involved in using total stations/EDM's to survey and set out for construction and building work. The course is suitable for staff with Total Station / EDM experience but little or no data logging or computerised surveying experience.

On completion of the course delegates should be able to:-

- **Extract digital data from digital drawings and transfer to a Total Station/EDM.**
- **Use the total Station/EDM to compute and set out points.**
- **Use Missing Line (Tie Distance) and Coordinate functions to check setting out.**
- **Observe, code and record an as-built survey of set out points.**
- **Establish a working temporary benchmark on site.**
- **Observe, record and calculate the level of existing features.**
- **Set out given level values, including soffits.**
- **Calculation of drainage runs.**
- **Set out profiles and calculate traveller lengths.**

CLTS/SE6 Site Surveying and Setting Out for Engineers
[5 Day Course]

The course is designed for engineering staff, who may have graduated from university with limited surveying knowledge and little practical experience. It is also relevant to site based consultants and other specialist engineers who require basic survey and setting out knowledge and skills.

On completion of the course delegates should be able to:-

- **Understand basic concepts of survey; the nature of errors, and their effects on survey measurements, and the need for Quality Control.**
- **Understand measurement by tape and EDM, including sources of error.**
- **Set up, read, book and reduce levels for establishing TBM's and heights of points, including soffits; set out given level values, including drainage profiles.**
- **Set up and use a theodolite/total station/EDM for basic surveys, setting out and as-built survey checks.**
- **Understand and follow site survey procedures and workflows.**
- **Understand the need for site coordinate control systems (local, National and others), and the importance of regular checks on all control points (horizontal and vertical).**
- **Calculate polar coordinates from given design data, then set out points by theodolite/tape and by total station, followed by performing Quality Control checks using total station functions (Missing Line/TieDistance), record an as-built survey.**
- **Use Total Station/EDM functions such as Resection, Remote Elevation Measurement, Reference Line etc.**
- **Other topic areas as required -- basic concepts of setting out of roads/railways, setting out of curves, calculation of areas and volumes,etc.**

CLTS/SE7 Site Surveying and Setting Out for Engineers Phase 2
[2 Day course]

The course is designed for engineering staff with instrument knowledge and practical site experience. It is also relevant to site based consultants and other specialist engineers who have basic survey and setting out knowledge and skills.

On completion of the course delegates should be able to:-

- **Understand the need for primary and secondary control networks, and regular checks.**
- **Understand the different methods of creating control networks – triangulation, traverse, GPS.**
- **Observe and compute a traverse, including adjustments.**
- **Understand the basic principles of GPS/GNSS, and the main sources of error affecting point positioning.**
- **Understand GPS/GNSS coordinate systems, basic Geodesy, and National/Local coordinate systems.**
- **Be aware of the different types of GPS/GNSS receivers, and their applications in the Construction Industry.**
- **Understand the principles and practice of different GPS survey modes; Static, Kinematic, RTK, NRTK, etc.**
- **Extract coordinate data from digital drawings, transfer to total stations for setting out, then download an as-built survey to compare with the digital design data, and interface with CAD and other software.**
- **Produce arae and volume calculations by hand, and using software.**

CLTS/SE8 Total Stations (EDM) Familiarisation
[1 Day Course]

The course is designed for site managers, site engineers and those who are involved in setting out and survey work who need to use a new or different type of total station.

On completion of the course delegates should be:-

- **Familiar with a Leica, Sokkia. Topcon or other manufacturers standard or robotic total stations, as required.**
- **Familiar with the various functions available.**

CLTS/SE9 Advanced Survey Technology Awareness Course
[2 Day Course]

The course is designed for more senior engineering staff and site agents who may need an overview of the latest technology and software solutions available to teh Construction Industry. It is also relevant to consultants and other specialists alongside the survey and construction industries.

On completion of the course delegates should be aware of the latest technology available to them on site:-

- **Reflectorless, Robotic and Imaging total stations, GPS/GNSS, Laser Scanners, Underground Service Location, Ground Penetrating Radar etc.**
- **Management and care of survey equipment, Hire/Off-hire of equipment, Calibration of equipment.**
- **Site Control Grids, and associated problems.**
- **Local, National and other special construction site grids.**
- **GPS/GNSS coordinate systems, and basic Geodesy.**
- **Be aware of the different types of GPS/GNSS receivers, and their applications in Construction.**
- **I.T. in the Construction Industry -- CAD, digital data exchange, Collaborative software, BIM (Building Information Modelling).**

CLTS/SE10 Horizontal and Vertical Alignment of Structures
[1 Day Course]

The course is designed for site managers, site engineers and those who are involved alignment of structures during and/or after fabrication and construction/erection.

On completion of the course delegates should beable to:-

- **Understand the techniques involved from the very basic to the advanced.**
- **Align steel structures during fabrication/erection, using a theodolite or total station.**
- **Check alignment of existing structures.**
- **Understand the nature of errors in measurement and the need for Quality Control.**

Courses For Surveyors:

CLTS/S1 Levelling
[2 Day Course]

The course is designed for people who need to be able to height or check the height points in the landscape or around buildings/structures. Little or no previous experience is required, but some basic understanding of the need to use levels and transfer height information is desirable.

On completion of the course delegates should be able to:-

- **Set up and use automatic levels.**
- **Read the level staff, book and reduce levels.**
- **Understand sources of error in leveling.**
- **Check the level for collimation error.**
- **Establish a working temporary benchmark on site.**
- **Observe, record and calculate the level of existing features, including soffits.**
- **Compare the height of points or check the height of points against design drawings.**
- **Calculation of drainage runs.**
- **Set out profiles and calculate traveller lengths.**

CLTS/S2 Introduction to use of Total Stations (EDM)
[2 Day Course]

The course is designed for those professionals or others who are involved in surveying sites or buildings for development, archaeology or any other reasons. The course is suitable for anyone who has a basic grasp of surveying but little theoretical knowledge or practical skill of using total stations for positioning points of detail, and mapping software.

On completion of the course delegates should be able to:-

- **Set up and use Total Station/EDM.**
- **Understand how EDM work.**
- **Understand use of different coordinate reference systems.**
- **Understand the concepts of mapping software and the use of coding.**
- **Undertake a simple site survey, and apply codes.**
- **Process the survey data to produce a basic survey plot.**
- **Export or plot the survey.**
- **Understand the sources of errors in EDM equipment and the process of surveying.**

CLTS/S3 Site Surveying
[5 Day Course]

The course is designed those who may have graduated from university with limited surveying knowledge and little practical experience. It is also relevant to other professionals/consultants who require basic survey and mapping knowledge and skills.

On completion of the course delegates should be able to:-

- **Understand basic concepts of survey; the nature of errors, and their effects on survey measurements, and the need for Quality Control.**
- **Understand measurement by tape and EDM, including sources of error.**
- **Set up, read, book and reduce levels for establishing TBM's and heights of points, including soffits, understand errors in levelling, carry out a Two-peg Test, set out given level values.**
- **Understand how a theodolite/total station works, then set up and use a theodolite/total station/EDM forbasic surveys and positioning, including use of coding and mapping software to create survey plans for plotting or exporting to other drawing formats.**
- **Understand the need to follow survey procedures and workflows.**
- **Understand the different site coordinate control systems (local, National and others), and the importance of regular checks on all control points (horizontal and vertical).**
- **Use a total station for setting out of design coordinates, manually and by automated data transfer.**
- **Use total station/EDM functions such as Resection, Remote Elevation Measurement, Reference Line etc.**
- **Other topic areas as required -- basic concepts of setting out of roads/railways, setting out of curves, calculation of areas and volumes, introduction to GPS/GNSS, high precision measurement, etc.**

CLTS/S4 Total Stations (EDM) Data Exchange
[1 Day Course]

The course is designed for those professionals or others who are involved in surveying sites or buildings and then need to export data from their measuring device to various computer programs using different data formats

On completion of the course delegates should be able to:-

- **Observe a data set of coordinated points, download to create a digital survey plot in mapping software.**
- **Edit digital survey drawings.**
- **Export digital surveys in various data/drawing formats; csv, xls, dwg, dxf etc.**

CLTS/S5 Topocad Mapping Software Training
[1 Day to 3 Day Courses]

The courses are designed for those professionals or others who have purchase Topocad mapping software and need to learn how to use the software for downloading survey data to produce survey drawings for plotting or export to CAD packages. The length of course will depend on previous knowledge of mapping software and which modules have been purchase (Base survey module, Earthworks, or Design modules).

Specialist Courses:

CLTS/SP1 GPS/GNSS Awareness [1 Day Course]

The course is designed for professionals and any others who need to be able to understand how GPS/GNSS systems work and how they can be used in the Surveying, Construction, Utility and GIS Industries.
Little or no previous experience is required, but some basic understanding of the need to position points for data collection.

On completion of the course delegates should be able to:-
- **Understand the principles of GPs/GNSS.**
- **Understand the basics of Geodescy, coordinate systems and datums.**
- **Understand the principles and practice of different modes of GPS surveying.**
- **Know the wide range ofGPS/GNSS applications.**
- **Have an appreciation of positioning accuracy, and the limitations of GPS/GNSS.**
- **Use a range of GPS equipment (hand-held, GIS data collection, high precision survey).**

CLTS/SP2 High-Precison Industrial Measurement
[1 Day Course]

The course is designed for surveyors and engineers who need to measure structures or objects with sub-millimetre accuracy for alignment, fabrication and/or repair.
Some previous experience of precise measurement is useful, but not essential.

On completion of the course delegates should be able to:-
- **Understand the principles of high-precision surveying.**
- **Understand the nature of errors and the need for Quality Control.**
- **Know the types of equipment available for sub-millimetre measurement.**
- **Understand the techniques of high-precision measurement.**
- **Have an appreciation of the industrial applications.**
- **Undertake a simulated survey using high-precsion techniques.**

CLTS/SP3 Introduction to Building Information Modelling
[1 Day Course]

Building Information Modelling (BIM) is the buzz word within the construction industry at the moment, yet many people do not understand what BIM is. BIM is the virtual design construction and then the management of buildings, enabling all participants within this construction cycle to work in a collaborative way. In the UK, where change within the construction industry is very conservative BIM has been very slow off the ground and due to this the UK government is strongly encouraging the industry to adopt BIM, by putting in markers and milestones over the next few years. Which will mean if a company hasn't adopted it by 2016 at the latest they will be unable to tender for any construction related design work within the public domain in relation to buildings. Therefore companies need to take steps in educating their staff and then changing the way they work in order to keep working in the future.

The course is designed for professionals and any others (Directors, senior managers and decision makers) who need to understand what BIM is, and how it works. Little or no previous experience is required.

On completion of the course delegates should be able to:-

- **Explain what BIM is, and what it is not.**
- **Explain why their company should use BIM.**
- **Give examples of where BIM could be applied to their business.**
- **Discuss the pros and cons of using BIM, in particular potential cost, time and resource savings.**
- **Talk with confidence about future applications of BIM and potential developments.**

CLTS/SP4 Revit Training
[1 Day Course]

A training course in the use of Revit software is at present being developed.